

**REMARKS**

In response to the Office Action mailed February 28, 2003, Applicants respectfully request reconsideration. To further the prosecution of this application, each of the issues raised in the Office Action is addressed herein.

Claims 1-51 are pending in this application, of which claims 1, 22-34, 38, 42 and 43 are independent claims. By this amendment, Applicants have amended claims 28, 31, and 32. Also, Applicants have added new claims 44-51 to further define Applicants' contribution to the art. No new matter has been added. The application as now presented is believed to be in allowable condition.

**A. Allowed Claims/Allowable Subject Matter**

Applicants note with appreciation that on page 8, the Office Action indicates that claims 42 and 43 are allowed, and that claims 35-37 and 39-41 are objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form to include all of the limitations of their respective base claims and any intervening claims. As discussed in the arguments below, independent base claims 34 and 38 are believed also to be in allowable condition as pending. Accordingly, at this time, Applicants have not rewritten dependent claims 35 and 39 in independent form to include all the limitations of their respective base claims, but reserve the right to do so in the future if deemed necessary.

**B. Claim Rejections Under 35 U.S.C. §102**

**1. Hed (U.S. Patent Number 5,301,090)**

On page 2 of the Office Action, claims 1-16, 18, 19, 27 and 28 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Hed (U.S. Patent No. 5,301,090). Applicants respectfully traverse these rejections.

Applicants' claim 1 is directed to an apparatus comprising one of a pool and a spa to contain a liquid. The apparatus also includes at least one light source supported by the one of the pool and the spa to illuminate the liquid, wherein the at least one light source includes at least one LED.

Hed fails to disclose or suggest the apparatus of claim 1. In particular, Hed fails to disclose or suggest a light source that is supported by a pool or a spa. In fact, Hed completely teaches away from such an arrangement. Instead, in connection with light sources for wet environments, Hed's disclosure is limited to light sources that are *located remotely* from a liquid to be illuminated, so as to avoid any danger of shorting electrical wires or contacts and generally allow for safe operation, including proper heat dissipation, in potentially hazardous environments (col. 1, line 65 - col. 2, line 2; col. 2, lines 25-33; col. 3, lines 1-14; col. 14, line 41 *et seq*).

As noted in the Office Action, Hed discloses in connection with Fig. 8a a bathing unit 120 having a tub 121, in which one or more walls of the bathing unit or tub is equipped with a "light extractor based luminaire." With respect to this bathing unit/tub embodiment, Hed specifically indicates that an appropriate example of the light extractor based luminaire suitable for the bathing unit/tub is described in connection with Hed's Fig. 6 (col. 14, lines 52-58).

In connection with Fig. 6, Hed discloses a white light illumination system utilizing bundles of optical fibers to transmit light from a remotely located light source to a target illumination area (col. 12, lines 17-22). In particular, the system of Hed's Fig. 6 includes a single remotely located high intensity discharge (HID) source 94, which generates light through a reflective or refractive optical element 95 into multiple bundles of optical fibers 88, 89 and 90 (col. 12, lines 60-68). Each of the fiber bundles is coupled to respective "luminaires" 85, 86 and 87. Each luminaire is configured to distribute the light received via the optical fibers over an illumination area (col. 12, lines 23-33).

An example of such a luminaire is described in connection with Hed's Fig. 3, wherein a luminaire 40 includes light extraction fibers, or light guides 46, 47 and 48, for guiding and emanating light (col. 9, lines 1-15). Hed discloses that by positioning one or more light sources remotely from such a luminaire and transmitting the light into the luminaire by optical fibers or optical wave guides, high intensity light sources can be used, wherein the conversion of electricity to light is accomplished at a remote location (col. 10, lines 45-68). This configuration facilitates heat removal and overall safe operation by not having live electrical wiring in the area around the illuminated zone (Id.).

In Hed's Fig. 8a, wherein such a lighting system is used in connection with a bathing unit 120 and tub 121, it should be readily appreciated that a single high intensity discharge (HID) 702461.1

light source 131 is located remotely from the bathing unit 120 and the tub 121 (i.e. the light source *is not supported* by either the bathing unit or the tub). A concentrator 132 directs light from the light source 131 into a plurality of optical fiber bundles 133 and 134 which transmit the light generated in the remote location to one or more luminaries that are disposed in one or more walls of the bathing unit 120 or the tub 121 (col. 15, lines 8-22). As discussed above, the luminaire(s) then emanate the light received via the optical fiber bundles so as to illuminate an area of the bathing unit/tub.

Accordingly, in Hed, at best it is the luminaire, *and not the light source itself*, that may be said to be “supported by” the bathing unit or tub. Again, nowhere in the reference does Hed disclose or suggest a light source that is supported by the bathing unit or the tub; rather, Hed explicitly teaches away from such an arrangement, by repeatedly describing the advantages of having a light source located remotely from the bathing unit/tub for various safety purposes (col. 3, lines 8-14).

Moreover, Hed only discloses the use of a high intensity white light source in connection with the bathing unit 120 and tub 121 shown in Fig. 8a; interestingly, at no point does Hed disclose or suggest the use of multicolor LEDs as light sources for the bathing unit/tub embodiment. This is particularly noteworthy, since Hed indeed discloses the use of multicolor LEDs as light sources in other embodiments not related to the bathing unit/tub embodiment of Fig. 8a.

For example, in connection with Hed’s Fig 5, Hed discloses a luminaire 70 that receives light from three monochromatic light sources 71, 72 and 73, which can be red, green and blue LEDs respectively (col. 11, lines 1-10). However, nowhere in the reference does Hed disclose or suggest that the LEDs would provide a significant and sufficient intensity of light for the bathing unit/tub embodiment of Fig. 8a. Rather, as discussed above, it is noteworthy that Hed only refers to a high intensity discharge source, such as that described in connection with Fig. 6, for the bathing unit/tub embodiment (and other similar applications like lighting of swimming pools) (col. 14, lines 52-59; col. 15, lines 22-28).

In contrast to Hed, Applicants’ claim 1 recites an apparatus comprising one of a pool and a spa to contain a liquid, and at least one light source supported by the one of the pool and the spa to illuminate the liquid, wherein the at least one light source includes at least one LED. For 702461.1

at least the reasons discussed above – namely, Hed failing to disclose or suggest a light source supported by a pool or a spa, as well as failing to disclose or suggest a light source for a pool or spa including at least one LED - claim 1 patentably distinguishes over Hed and is in condition for allowance. Therefore, the rejection of claim 1 under 35 U.S.C. §102(b) as allegedly being anticipated by Hed should be withdrawn.

Claims 2-21 and 44 depend from claim 1 and are believed to be allowable based at least upon their dependency.

Claim 27 is directed to a method of illuminating a liquid, comprising an act of illuminating the liquid with radiation output simultaneously by at least two differently colored LEDs. As discussed above, nowhere in the reference does Hed disclose or suggest that a liquid may be illuminated by radiation output simultaneously by at least two differently colored LEDs. More specifically, while Hed does disclose a lighting apparatus employing differently colored LEDs as illustrated at least by Hed's Fig. 5, at no point does Hed disclose or suggest that this apparatus may be used for the bathing unit/tub embodiment of Hed's Fig. 8a. In contrast to Hed, Applicants' claim 27 specifically recites an act of illuminating a liquid with radiation output simultaneously by at least two differently colored LEDs. Accordingly, claim 27 patentably distinguishes over Hed and is in condition for allowance. Therefore, the rejection of claim 27 under 35 U.S.C. §102(b) as allegedly being anticipated by Hed should be withdrawn.

Claim 49 depends from claim 27 and is believed to be allowable based at least upon its dependency.

Claim 28, which has been amended to address a minor informality, is directed to a method for illuminating a liquid in one of a pool and a spa, comprising an act of illuminating the liquid in the one of the pool and the spa with radiation output by at least one LED. For reasons similar to those discussed above in connection with claim 27, claim 28 patentably distinguishes over Hed and is in condition for allowance. Therefore, the rejection of claim 28 under 35 U.S.C. §102(b) as allegedly being anticipated by Hed should be withdrawn.

Claims 50 and 51 depend from claim 28 and are believed to be allowable based at least upon their dependency.

2. Evans (U.S. Patent Number 4,305,117)

On page 4 of the Office Action, claims 22, 23, 26, 29, 30 and 33 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Evans (U.S. Patent No. 4,305,117). Applicants respectfully traverse these rejections.

Claim 22 is directed to an apparatus, comprising one of a pool and a spa to contain a liquid. The apparatus of claim 22 further comprises at least one housing supported by the one of the pool and the spa, and at least two independently controlled light sources, disposed in a single housing of the at least one housing, to illuminate the liquid.

Evans fails to disclose or suggest the apparatus of Applicants' claim 22. In particular, Evans fails to disclose or suggest at least two independently controllable light sources *disposed in a single housing* supported by one of a pool and a spa.

Rather, with reference to Evans' Figs. 1 and 2, Evans merely discloses an illuminated water fountain system that coordinates multicolor lighting effects with accompanying music (Abstract). Evans' fountain system includes a bowl structure 16 for providing a fountain pool 18, and a water fountain and illumination assembly located within the fountain pool (col. 2, lines 43-51). The fountain assembly has an upright water nozzle 12 carried on a base housing 14 located generally in the central region of the bowl structure 16. In Evans, a plurality of differently colored lamps are mounted on a plurality of rigid lamp support arms that extend radially outward from the water nozzle base housing 14 to provide multicolor illumination for the fountain in response to music (col. 3, lines 26-29).

For example, Evans' Fig. 1 illustrates that a number of red lamps 34 are mounted on support arms 36, while a number of blue lamps 40 are mounted on support arms 42, and a number of green lamps 46 are mounted on support arms 48 (col. 3, lines 30-68; col. 4, lines 1-3). Evans discloses that the light intensity of the lamps in each different color group is adjustable independently of the lamps in the other groups (col. 5, lines 3-5). In particular, the lamps in each group are connected in parallel so that all lamps in each group have essentially the same adjustable intensity in response to an input music or other audio signal (col. 5, lines 3-28).

Evans is completely silent with respect to the type of housing that is used for each of the lamps shown in Figs. 1 and 2. In Fig. 2, Evans depicts the lamps as being disposed under water and apparently lodged in some sort of enclosure or housing with a transparent cover. However, 702461.1

again, at no point does Evans specifically discuss the particular construction of the lamps or any housing to support or enclose the lamps. Rather, Evans merely discusses the circuitry used to energize the lamps without saying anything about the structural arrangement of the lamps themselves (col. 9, line 11 *et seq.*).

It is particularly noteworthy that nowhere in the reference does Evans disclose or suggest that at least two independently controllable light sources are *disposed in a single housing supported by a pool or a spa*. At best, Evans merely discloses a plurality of individual lamps that are supported by arms that extend radially from a nozzle housing in a fountain pool. In Evans, these individual lamps are neither disposed together in any housing, nor supported by the bowl structure that forms the fountain pool.

In contrast to Evans, Applicants' claim 22 is directed to an apparatus comprising one of a pool and a spa to contain a liquid, at least one housing supported by the one of the pool and spa, and at least two independently controllable light sources, disposed in a single housing of at least one housing, to illuminate the liquid. For at least the reasons discussed immediately above, claim 22 patentably distinguishes over Evans and is in condition for allowance. Therefore, the rejection of claim 22 under 35 U.S.C. §102(b) as allegedly being anticipated by Evans should be withdrawn.

Claim 23 is directed to an apparatus comprising one of a pool and a spa to contain liquid, and at least one light source, supported by the one of the pool and the spa, to illuminate the liquid. The at least one light source is adapted to generate radiation of different colors without requiring the use of a color filter.

Evans fails to disclose or suggest the apparatus of claim 23. In particular, Evans fails to disclose or suggest any light source that is adapted to generate radiation of different colors.

Specifically, as discussed above, every lamp disclosed by Evans is capable of generating only one color of light (col. 4, lines 20-61). Stated differently, there is no lamp in Evans that is adapted to generate radiation of different colors, as recited in claim 23. Rather, different colors are generated in Evans only by combining different primary colors of light that are output by multiple single color lamps. Accordingly, for at least the foregoing reason, Applicants' claim 23 patentably distinguishes over Evans and is in condition for allowance. Therefore, the rejection of claim 23 under 35 U.S.C. §102(b) as allegedly being anticipated by Evans should be withdrawn.

Claim 26 is directed to an apparatus comprising one of a pool and a spa to contain a liquid, and a networked lighting system coupled to the one of the pool and the spa to illuminate the liquid. The networked lighting system comprises a first independently controllable light source supported by the one of the pool and the spa, and a first independently addressable controller coupled to the first independently controllable light source. The apparatus further comprises at least one other independently controllable light source that is supported by the one of the pool and the spa, and at least one other independently addressable controller coupled to the at least one other independently controllable light source and the first independently addressable controller.

Evans completely fails to disclose or suggest the apparatus of Applicants' claim 26. In particular, Evans fails to disclose or suggest one or more independently addressable controllers as recited in claim 26. The Office Action alleges, on page 4, that Evans discloses independently addressable controllers in Evans' Fig. 3, pointing to a high frequency phase controller 116 and a mid-range phase controller 118. Applicants respectfully disagree with this characterization; in no way can the high frequency phase controller 116 and a mid-range phase controller 118 disclosed in connection with Evans' Fig. 3 be fairly characterized as "independently addressable controllers."

As discussed in Applicants' specification, at least on page 24 in the paragraph beginning on line 8, a given light source controller is "independently addressable" in that the controller may receive data from a data network that is intended for multiple controllers coupled to the network, but selectively "picks-off" particular data from the network intended for one or more outputs supported by the independently addressable controller. There are no elements or devices that perform such a function in Evans' disclosure. In particular, the high frequency phase controller 116 and the mid-range phase controller 118 shown in Evans' Fig. 3 do not receive from a network data that is intended for multiple controllers, and they certainly do not "pick-off" data intended only for a particular controller; in fact, there is no network or network data disclosed or suggested in Evans.

Rather, the circuitry illustrated in Evans' Fig. 3 merely takes a two-channel audio signal and separates the audio signal into three frequency band components (low frequency, mid-range frequency and high frequency) (col. 5, line 29 *et seq.*). A signal corresponding to the high

frequency component is used to drive the high frequency phase controller 116, whereas a different signal corresponding to the mid-range component is used to drive the mid-range controller 118. Based on these respective control signals, each of the high frequency and mid-range phase controllers 116 and 118 implements a phase modulated control scheme to connect one or more lamps to a 120 Volt/60 Hz AC power source by periodically controlling current conduction through the lamp(s) via a triac (col. 9, lines 11-68; col. 10, lines 1-5).

22=29  
Claim 22 is directed to a method for illuminating a liquid in one of a pool and a spa, comprising an act of illuminating the liquid with radiation output by at least two independently controllable light sources disposed together in a housing coupled to the one of the pool and the spa. For reasons similar to those discussed above in connection with claim 22, claim 22 patentably distinguishes over Evans and is in condition for allowance. Therefore, the rejection of claim 22 under 35 U.S.C. §102(b) as allegedly being anticipated by Evans should be withdrawn.

29=30  
Claim 29 is directed to a method for illuminating a liquid in one of a pool and a spa, comprising an act of illuminating the liquid with radiation output by at least two independently addressable light sources, coupled together to form a networked lighting system. For reasons similar to those discussed above in connection with claim 29, claim 29 patentably distinguishes over Evans and is in condition for allowance. Therefore, the rejection of claim 29 under 35 U.S.C. §102(b) as allegedly being anticipated by Evans should be withdrawn.

30=31  
Claim 30 is directed to a method for illuminating a liquid, comprising an act of illuminating the liquid with radiation output by at least one light source. The at least one light source is adapted to generate radiation of different colors without requiring the use of a color filter. For reasons similar to those discussed above in connection with claim 30, claim 30 patentably distinguishes over Evans and is in condition for allowance. Therefore, the rejection of claim 30 under 35 U.S.C. §102(b) as allegedly being anticipated by Evans should be withdrawn.

33=36  
Claim 33 is directed to a method for illuminating a liquid, comprising an act of illuminating the liquid with radiation output by at least two independently addressable light sources, coupled together to form a networked lighting system. For reasons similar to those discussed above in connection with claim 33, claim 33 patentably distinguishes over Evans and is in condition for allowance. Therefore, the rejection of claim 33 under 35 U.S.C. §102(b) as allegedly being anticipated by Evans should be withdrawn.

C. Claim Rejections Under 35 U.S.C. §103

1. Rejections based on Hed

On page 5 of the Office Action claims 17, 20 and 25 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Hed. Applicants respectfully traverse these rejections.

Claims 17 and 20 depend from claim 1 and are believed to be allowable based at least upon their dependency. With respect to claim 17, the Office Action concedes that Hed does not specifically disclose an apparatus wherein a controller outputs at least one control signal to at least one light source to control radiation output by the at least one light source, wherein the at least one control signal includes at least one pulse width modulated signal. The Office Action goes on to state however, on page 5, that the Examiner takes official notice of a “well-known controller encompassing PWM [sic] function, i.e., capable of providing PWM signal [sic] with duty cycle being controlled to predict whether a light output will fall below or exceed a pre-determined threshold, thereby broadening the spectrum of the LEDs.” The Office Action goes on to say that it allegedly would have been obvious to a person having ordinary skill in the art at the time the invention was made “to well-known [sic] the well-known PWM controller into the Hed type system, because it would allow a control of the duty cycle to predict whether the light output will fall below or exceed a pre-determined threshold so as to broaden the spectrum of the LEDs, thereby improving the efficiency of the system.”

While Applicants are unclear as to the significance of controlling a duty cycle to predict whether the light output will fall below or exceed a pre-determined threshold so as to broaden the spectrum of the LEDs, thereby improving the efficiency of the system, as alleged in the Office Action, Applicants nonetheless acknowledge that the rejection set forth in the Office Action is based, at least in part, on alleged common knowledge in the art or well-known “prior art,” pursuant to MPEP §2144.03. Applicants respectfully traverse the assertion that any prior art exists that would have provided motivation to modify Hed so as to provide a controller that outputs at least one control signal including at least one pulse width modulated signal. If the rejection of Applicants’ claim 17 is to be maintained, the Examiner is respectfully requested to cite a reference in support of his position as required under MPEP §2144.03 or, if the Examiner

is relying upon facts within his personal knowledge, to file an affidavit establishing those facts pursuant to MPEP §2144.03.

Turning now to Applicants' claim 25, this claim recites an apparatus, comprising, *inter alia*, one of a pool and a spa to contain a liquid, and at least one light source supported by the one of the pool and the spa to illuminate the liquid. As discussed above, at least in connection with claim 1, Hed fails to disclose or suggest a light source supported by one of a pool and a spa, as recited in claim 25. Instead, Hed merely discloses a bathing unit and a tub for which a remotely located light source provides illumination via one or more fiber optic bundles. Hed explicitly teaches away from having a light source supported by the bathing unit or tub, as Hed repeatedly emphasizes that locating a light source remotely from the wet environment facilitates safe operation and adequate cooling for high intensity light sources. For at least the foregoing reasons, claim 25 patentably distinguishes over Hed and is in condition for allowance.

Therefore, the rejection of claim 25 under 35 U.S.C. §103(a) as allegedly being obvious over Hed should be withdrawn.

## 2. Rejections based on Hed and Evans

Claim 21 was rejected under 35 U.S.C. §103(a) as allegedly being obvious over Hed in view of Evans. As claim 21 depends from claim 1, it is believed to be allowable based at least upon its dependency. However, Applicants' respectfully traverse the rejection of claim 21 over the combination of Hed and Evans, as it is respectfully believed that this combination is improper. For the sake of brevity, Applicants' believe it is unnecessary at this time to discuss the impropriety of combining Hed and Evans (as claim 21 depends from an allowable base claim), but reserve the right to do so if deemed necessary in the future.

## 3. Rejections based on Evans and Chliwnyj

Claims 24, 31 and 32 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Evans in view of Chliwnyj et al. (U.S. Patent No. 5,924,784). Applicants' respectfully traverse these rejections.

a. The Combination of Evans and Chliwnyj is Improper

As set forth in MPEP §2143, three criteria must be met in order to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the cited references or to combine reference teachings. Second, there must be a reasonable expectation of success. The teaching or suggestion to modify the references or to combine reference teachings, as well as the reasonable expectation of success, must both be found in the prior art and not based on Applicants' disclosure. Third, the prior art references, when viewed as a whole, must teach or suggest all of the claimed features.

Neither Evans nor Chliwnyj, or any other reference of record, provides any teaching, suggestion, or motivation to combine Evans and Chliwnyj in any manner. Moreover, the Office Action fails to specify any reasonable or compelling motivation to combine these references, and completely fails to discuss the reasonable expectation of success in making such a combination.

Instead, on page 7, the Office Action merely states that allegedly "it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the microprocessor-based controller as taught by Chliwnyj into the Evans type apparatus, because it would insure a natural random process that engenders a pleasing, soothing visual effects [sic.] to a viewer, thereby improving the efficacy of the apparatus." However, the Office Action fails to specify any indication, either in the references themselves or in the knowledge generally available in the art, why one of ordinary skill would reasonably expect to be successful in combining Evans and Chliwnyj. Most notably, the Office Action does not specify or suggest in any manner how one of ordinary skill in the art specifically would combine the teachings of Evans and Chliwnyj to successfully realize the apparatus or methods of Applicants' claims.

In view of the foregoing, the Office Action fails to establish a *prima facie* case of obviousness based on the combination of Evans and Chliwnyj, as both motivation and a reasonable expectation of success are lacking. Accordingly, the combination of Evans and Chliwnyj is improper, and therefore the rejections of claims 24, 31 and 32 under 35 U.S.C. §103(a) should be withdrawn.

Brief discussions of the Evans and Chliwnyj references follow, so that the impropriety of the combination may be discussed in greater detail below.

b. Evans (U.S. Patent No. 4,305,117)

As discussed above, Evans is directed to an illuminated water fountain wherein an illumination apparatus for the fountain is capable of generating different colors in response to musical tone variations (Abstract). Evans specifically discloses that three sets of lamps, each set having a different color, are used to illuminate the fountain, wherein a blending of the three different colors can produce an essentially infinite number of reflected colors and blends of colors (col. 4, lines 60-61). Evans accomplishes such color variation by varying the intensity of light from each set of lamps in response to particular frequencies of music (col. 4, lines 55-65). More specifically, the light intensity of the lamps in each differently colored group is adjustable independently of the lamps in other groups, and the content of sound within different frequency ranges is used to provide control over the intensity of the lamps associated with a particular frequency range (col. 5, lines 3-13).

In Evans' preferred embodiment, a set of red lamps is associated with low frequency components of a musical sound, a set of green lamps is associated with an intermediate or mid-range frequency of the musical sound, and a set of blue lamps is associated with higher frequency components of the musical sound (col. 5, lines 13-19). Thus, as the content of sound within the different frequency ranges increases, the intensity of a corresponding set of colored lamps also increases (col. 5, lines 19-22). From the foregoing, it should be readily appreciated that the blended color of light that illuminates the fountain at any given time in Evans is hardly a random process; rather, each color that is generated by a particular blending of differently colored lamp sources is specifically associated with the frequency content of a music or other audio signal at any given time. An exemplary circuit for accomplishing this function is described in connection with Evans' Fig. 3, where it may be readily appreciated that the circuit essentially comprises a number of amplifiers and filters to separate the input music/audio signal into its constituent frequency band components.

It is also noteworthy that the light sources of Evans clearly are conventional incandescent light sources that derive power from a conventional 120 Volt/60 Hz AC power source. This is clear from the description of Evans' intensity control circuitry, as discussed in connection with Evans' Fig. 3, particularly in col. 9, line 11 – col. 10, line 5. In this passage, Evans discloses a

phase modulation technique in which a triac is switched on and off during different cycles of an AC power signal to deliver AC power to the lamps. While this type of control method is commonly employed to control the intensity of light generated by incandescent light sources, it is particularly noteworthy that this control method is completely inappropriate for semiconductor-based light sources such as LEDs.

c. Chliwnyj (U.S. Patent No. 5,924,784)

Unlike Evans, Chliwnyj is directed to a microprocessor-based simulated flame light bulb that employs small low-powered LED light sources (col. 2, lines 26-41). In Chliwnyj, the respective intensities of different LED colors are modulated by a microprocessor-based control circuit that executes a pre-programmed algorithm which causes the lighting device to simulate a realistic flame (Abstract). The program contains random elements to keep the simulated flame constantly changing, and effects such as a random gust of wind and other disturbances are inserted into the flame simulation by the program from time to time. The net result is that the simulated flame is a slowly changing series of random patterns resulting in a soothing and calming effect upon the viewer.

It is noteworthy that nowhere in the reference does Chliwnyj disclose or suggest that the light generated by the simulated electronic flame apparatus is responsive to music or any audio signal; rather, as discussed above, Chliwnyj specifically emphasizes that the simulated flame is the result of random pre-programmed elements that are not responsive to any particular external stimulus. It is also noteworthy that nowhere in the reference does Chliwnyj disclose or suggest that the simulated electronic flame lighting device would be useful or desirable in wet environments (e.g., to illuminate a fountain, a pool, etc.).

d. There is No Motivation to Combine Evans and Chliwnyj and No Reasonable Expectation of Success

Evans and Chliwnyj address two unrelated problems and solve their respective problems by unrelated solutions. Evans is concerned primarily with providing multi-color illumination for a fountain, wherein the colored illumination is specifically responsive to different frequencies of an input music signal. Evans proposes a solution to this problem by providing a control circuit

that drives three sets of differently colored lamps (e.g., representing the primary colors red, green and blue) in response to high, mid-range and low frequencies of the music input, respectively.

In contrast to Evans, Chliwnyj is concerned primarily with the problem of electronically simulating a small candle-like flame using a conventional light bulb configuration, for use in monuments or memorials, for example. Chliwnyj proposes a solution to this problem by providing a microprocessor controlled lighting device including different color LED light sources. A microprocessor-based control circuit executes a program that ultimately controls the intensity of different color LEDs to simulate a realistic flame by including random elements in the executed program.

In view of the foregoing, one of ordinary skill in the art simply would not be motivated, based on the references themselves or the knowledge generally available to skill in the art, to combine Evans and Chliwnyj.

The Office Action concedes, on page 7, that Evans fails to disclose or suggest a microprocessor-based controller for Evans' illumination system. The Office Action alleges, however, as discussed above, that it would have been obvious to provide in Evans a microprocessor-based controller as taught by Chliwnyj to ensure in Evans "a natural random process that engenders a pleasing, soothing visual effects [sic] to a viewer, thereby improving the efficacy of the apparatus." Applicants respectfully disagree.

First, and perhaps foremost, the alleged motivation proffered by the Office Action for combining Evans and Chliwnyj has absolutely no basis in the references viewed as a whole. Specifically, the Office Action alleges that a *random* process would be desirable in Evans, and that a microprocessor-based controller would facilitate such a process. It is clear from the Evans reference, however, that Evans has nothing to do with generating a random illumination process; rather, Evans clearly and specifically discloses that, in his lighting system, multiple color light is particularly generated in response to specific frequencies of an input music signal. Stated differently, in Evans, there is a specific correspondence between the color of light generated at any given time and the frequency content of an input music signal. This hardly can be considered a random process.

Second, it is noteworthy that the Office Action fails to provide any assessment of how the combination of Evans and Chliwnyj practically would be implemented, what such a combination

would result in, and if there is any reasonable expectation of success in implementing such a combination.

For example, in Evans, incandescent light sources are controlled using a phase modulation technique employing triacs to draw power from a 120 Volt/60 Hz AC power source. In contrast, the light sources in Chliwnyj are small low-powered LED sources that are controlled using a high frequency pulse width modulation technique (Chliwnyj, col. 9, lines 20-63). Thus, the light sources and control techniques in Evans and Chliwnyj are completely different. Furthermore, as highlighted above, the illumination control in Evans is responsive to music, whereas the illumination control in Chliwnyj is not responsive to any external stimulus, but rather is controlled by a stored program containing random elements.

In view of the foregoing, it is entirely unclear from the Evans and Chliwnyj references how different elements of these references would realistically be combined to provide a functioning device. Not only do the references viewed as a whole fail to provide any such teaching, suggestion or motivation, but furthermore the Office Action provides no insight as to how to practically and successfully implement such a combination. For at least the foregoing reasons, the Office Action fails to point to a reasonable expectation of success in combining the Evans and Chliwnyj references. Accordingly, the Office Action fails to establish a *prima facie* case of obviousness, and therefore the combination of Evans and Chliwnyj is improper. Thus, the rejection of claims 24, 31 and 32 under 35 U.S.C. §103(a) as allegedly being obvious over Evans in view of Chliwnyj should be withdrawn.

Claims 45-48 depend from claim 24 and are believed to be allowable based at least upon their dependency.

#### 4. Rejections based on Evans and Hamos

Claims 34 and 38 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Evans in view of Hamos et al. (U.S. Patent No. 5,117,233). Applicants respectfully traverse these rejections.

As with Evans and Chliwnyj, the combination of Evans and Hamos is improper. Neither Evans nor Hamos, or any other reference of record, provides any teaching, suggestion, or motivation to combine Evans and Hamos in any manner.

As discussed above, Evans is directed to illuminating a fountain with multi-color light that varies in response to a music signal. In Evans, the only device associated with the fountain other than the lighting system itself is a pump 22 for supplying water under pressure to the fountain. At no point does Evans disclose or suggest that the control of the pump is in any way related to the multi-color light generated by the lighting apparatus.

Unlike Evans, Hamos is directed to remote control systems for operating equipment associated with a spa, such as pumps, filters, and heaters. Nowhere in the reference does Hamos disclose or suggest any lighting or lighting control for a pool or a spa. Rather, the devices controlled in Hamos are particularly related to the comfort of one or more users that are bathing in the pool or the spa (Fig. 1, col. 1, lines 29-38; col. 2, lines 5-44). In contrast to Hamos, the system described in Evans clearly is not one in which one or more users would bathe. Hence, one of ordinary skill in the art seeking to modify any of the teachings of Evans simply would not look to Hamos for any such modification. For at least the foregoing reasons, the combination of Evans and Hamos is improper.

Moreover, Applicants' claims distinguish over Evans and Hamos, alone or in combination, whether or not the combination is proper. In contrast to both Evans and Hamos, Applicants' claims 34 and 38 recite that a device associated with one of a pool and a spa is controlled based on variable color radiation that illuminates a liquid contained in the pool or the spa. Neither Evans nor Hamos discloses or suggests such features. Accordingly, Applicants' claims 34 and 38 patentably distinguish over these references, alone or in combination, and are in condition for allowance. Therefore, the rejections of claims 34 and 38 under 35 U.S.C. §103(a) as allegedly being obvious over Evans in view of Hamos should be withdrawn.

Claims 35-37 and 39-41 depend from one of claims 34 and 38 and are allowable based at least upon their dependency. Moreover, the Office Action indicated that these claims recite patentable subject matter on their own merits.

#### D. New Claims

New claims 44-51 have been added to further define Applicants' contribution to the art. Each of these claims is fully supported by the specification as filed; hence, no new matter is added. Furthermore, each of these new claims depends from a base claim that is believed to be 702461.1

allowable, as discussed above. Accordingly, these claims also are believed to be allowable based at least upon their dependency.

E. General Comments on Dependent Claims

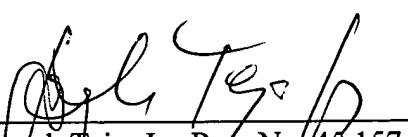
Since each of the dependent claims depends from a base claim that is believed to be in condition for allowance, for the sake of brevity Applicants believe that it is unnecessary at this time to argue the allowability of each of the dependent claims individually. However, Applicants do not necessarily concur with the interpretation of the dependent claims as set forth in the Office Action, nor do Applicants concur that the basis for the rejection of any of the dependent claims is proper. Therefore, Applicants reserve the right to specifically address the patentability of the dependent claims in the future, if deemed necessary.

**CONCLUSION**

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicants' attorney at the telephone number listed below to discuss any outstanding issues relating to the allowability of the application.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50/2762.

Respectfully submitted,  
*George G. Mueller et al., Applicants*

By: 

Joseph Teja, Jr., Reg. No. 45,157  
LOWRIE, LANDO & ANASTASI, LLP  
One Main Street  
Cambridge, Massachusetts 02142  
United States of America  
Telephone: 617-395-7000  
Facsimile: 617-395-7070

Docket No.: C01104/70002  
Date: August 28, 2003  
**x08/28/03x**